434 It is evident that in all the villages the great majority of the breadwinners must depend on sources of income other than their own fields. Therefore, younger members of the family seek income outside of the village, while the farmer himself must work part-time for one of the larger landlords or the oil company, hold a government job, get money from abroad, or subsist on a very low level.

Physical Description of Project Villages

392 It is not possible to describe with statistical accuracy the average village home in the project
345 area. A very general description must suffice until more detailed information is available. Homes are usually one-story stone structures of one or two rooms. They do not have electricity or running water. Usually the animals are accommodated in a stable connected to the house, or in a room in the house itself.

367 The villagers do not seem to be concerned with keeping their surroundings sanitary. In none
514 of the villages is there any attempt to collect and properly dispose of garbage. The uniform practice
744 is to disperse it in the fields. There are few toilets. Stone walls and fields close to town attest to
515 streets commonly used for sewage disposal. To serve the 5,643 people in the project area there are 82 pit privies. There are no tubs or showers. Homes have no screens and flies are free to contaminate food and mosquitoes to increase and transmit disease.

515 Homes are nearly always neat and clean and the people attempt to clothe themselves decently
602 with well-scrubbed garments. Though extremely poor, the village family is very hospitable and
574 insists on sharing with a guest its meager supply of cigarettes or treasured coffee and sugar.

361, 34 In the five project villages there are 1,100 buildings. This number includes 912 dwelling units, business establishments, 143 separate barns and 11 public buildings. A detailed break-down of the types of buildings by village is shown in Table VIII. Included in the category of public buildings are seven mosques. Sarafand and En-Nauriyah have two mosques each, while in each

their relatives abroad. The villages are less compact than in other parts of the Near and Middle East, and separate farmsteads are common. Extremes of poverty, associated with primitive standards of sanitation, are most frequently encountered in the villages of southern Lebanon. In the cities, substandard housing is found chiefly in the old, congested quarters and in the Armenian sections.

The typical dwellings in all parts of the country are constructed of stone, cement or concrete blocks, with a surface of whitewashed or tinted plaster. The roofs are of two general types: peaked and of red tile; or flat, with a covering of cement or of mud and brush. The houses vary in size from one to several rooms, sometimes with two or more stories. The use of wood as a building material is prohibited by the fire regulations in the towns, but small wooden shacks are occasionally seen on the outskirts.

Beirut is a cosmopolitan city, a mixture of Arabic and Western culture. The older parts of the city are overcrowded, with narrow streets lined by innumerable small shops, which frequently have living rooms in the rear. Apartment houses, interspersed with detached dwellings surrounded by colorful gardens, dominate the newer developments. Architecturally, all gradations are encountered between old Arab-style houses and modern villas.

ENVIRONMENT AND SANITATION

Water Supplies

Water supplies are obtained from streams, springs and wells, and, in general, are abundant in the coastal and the mountain districts but deficient in the interior. Beirut derives its water supply from the Nahr el Kelb, or Dog River, which is fed from an underground spring in the hills about 18 miles from the city. It flows by gravity through a tunnel and open canals to Dubaiya, 9 miles distant, where it is treated by preliminary rapid filtration, slow sand

filtration and chlorination. It is then pumped to 3 service reservoirs in the city and subsequently to the separate house connections. This supply is used only for domestic purposes, but the capacity of the present plant will soon be inadequate to meet the needs of the rapidly expanding population. The water is subjected to bacteriologic tests every other day at the waterworks, and is also examined periodically in the French university laboratories on behalf of the government authorities. Private wells provide supplementary sources of supply in some areas on the outskirts of the city.

The water supply for Tripoli is derived from springs in the near-by mountains. It is chlorinated before distribution, but is not otherwise treated. The water is comparatively free from contamination at the source, but pollution sometimes occurs in the distribution system. In the mountains, water is usually taken from springs, and in some localities it is piped from a common source to several adjacent villages. In the larger towns, as Aley and Zahle, it is treated by chlorination. Supplementary supplies are often provided by rain-water cisterns. In the poorer districts of the towns, and in the rural villages, water is distributed through community outlets and may be transported considerable distances by the individual families or by donkey carriers. Many well and spring sources are unprotected, and contamination is frequent. In parts of the LeLanon range the water passes through fissured limestone rock, and pollution may be traced to distant villages. The local water supplies are not continuously supervised by the government health officers, but samples are collected by the district physicians at irregular intervals, chiefly when contamination is suspected. These are sent to the bacteriologic laboratory of the French University medical school.

For many decades the only treatment works in the country was at Beirut. In 1948, the government undertook the construction of a plant on the Litany River in South

Lebanon to furnish filtered and chlorinated water to a number of villages in the area which were completely without suitable sources of supply. A program for the provision of satisfactory water supplies for most of the towns and the villages in the country has been projected by the Ministry of Public Works, which is responsible for their construction in consultation with the Ministry of Public Health.

Numerous small irrigation projects are in use, especially in the orange groves and the banana plantations of the coastal region and in the truck farm areas of the Bekaa. The majority depend upon wells operated by pumps. Two important large-scale programs have been undertaken within recent years: the diversion of the western portion of the Litany River, known as the Nahr el Kasmiya, to irrigate part of the coastal plain between Tyre and Sidon; and the construction of canals from the spring-fed Lake Yammouline, to provide for the irrigation of sections of the Bekaa, in the vicinity of Baalbeck. The harnessing of the Litany River for irrigation and hydroelectric purposes was started in 1952, while plans are under way for the irrigation of the 'Akkar plain from the Nahr el Kebir and adjacent streams and for the better utilization of the Orontes River.

Waste Disposal

Sewers exist in some of the larger communities, but septic tanks, cesspits and pit latrines are the usual methods of sewage disposal in most towns and villages. A sewerage system serves about 90 per cent of the city of Beirut, the sewage being discharged untreated into the sea from 7 major and numerous minor outlets. Septic tanks and latrines are employed for the houses which are not connected with the sewers. A municipal sewerage system also exists in part of Tripoli, but cesspits are used in many sections of the city. In some areas the sewage is collected in open drains for the irrigation of the orange groves, the fig orchards and the vegetable gardens.

p. 45(a)

Government regulations provide for the construction of sanitary facilities for every household in the rural areas, but they are not adequately enforced in many villages. The standards of sanitation are often low, particularly in South Lebanon, and pollution of the ground is a common practice. Night soil is frequently utilized as fertilizer, and the consumption of uncooked vegetables contaminated in this manner contributes to a high prevalence of intestinal infections.

Fauna and Flora

Arthropoda. Mosquitoes. To date, 9 species of anopheline mosquitoes have been reported from Lebanon, but only three—*Anopheles superpictus*, *A. sacharovi* (— *A. elutus*) and *A. claviger* (— *A. bifurcatus*)—are of primary concern as vectors of malaria. *A. pulcherrimus*, *A. sergenti*, *A. algeriensis*, *A. hyrcanus*, *A. multicolor* and *A. martini* have also been identified, but all are rare or localized in distribution.

A. superpictus is widespread and the most difficult to control, since it breeds prolifically in the numerous mountain streams, as well as in pools formed by the overflow from springs, in sand pits and in irrigation canals and seepages, where the water is clear and at least partially exposed to the sun. Larvae are found from April to November, with peaks of prevalence from July to September, in localities below 2,000 feet and over shorter periods at elevations up to 4,000 feet. *A. sacharovi* breeds in swampy areas and along the vegetated margins of ponds, cisterns and neglected irrigation canals and seepages. It is most abundant around the coastal swamps formed by obstructions at the mouths of the rivers and in the marshlands bordering large undrained springs in the Bekaa. Like *A. superpictus*, it breeds from April to November, while its prevalence varies with the degree of flooding during the rainy season. The preponderance of both species is influenced to a large extent by the timing and the volume of the winter and the spring rainfall.

p. 115(b)

diseases in Lebanon. A section for the compilation and the study of morbidity and mortality statistics was established in the Ministry of Public Health in 1951, but the data collected over previous decades are admittedly incomplete. With relatively few exceptions, the notification of communicable diseases was not compulsory. Resistance to quarantine regulations and fear of the social stigma often attached to certain diseases are among the factors contributing to a general laxity in the reporting of cases treated outside government hospitals and clinics. Although facilities are being expanded continuously, many cases of illness in the rural areas still receive little or no medical attention. Moreover, due to the inadequacy of laboratory services, the differential diagnosis is lacking in many conditions. For the most part, the mortality statistics are reliable in the towns, but in the more remote villages the causes of death may be certified by nonmedical officials. The deficiencies in reporting and the inaccuracies in diagnosis then detract from the validity of the disease statistics available.

Diseases Spread or Contracted Chiefly Through Intestinal or Urinary Tract

Typhoid and Paratyphoid Fevers. Enteric fevers are among the most important endemic diseases in the country. Typhoid fever is prevalent, with from 718 to 1,824 cases reported annually in the 8 years 1943-49. Water-borne outbreaks, caused by the pollution of spring and well supplies, are frequent, especially in the smaller towns and villages. The individual outbreaks vary in severity, but, in general, the fatality rates range from 5 to 11 per cent. One of the largest epidemics in recent years occurred in Zahle in 1946: over 1,000 cases were recorded. Typhoid fever persists throughout the year, usually with peaks of prevalence between May and October, and again in December and January. Water-borne outbreaks often coincide with the onset of the heavy rains in the early winter. The